REMARKS

From the Summary page, claims 1, 3-5 and 9-12 were pending. Claims 9-12 are withdrawn from consideration as being directed to a non-elected invention. Claims 1 and 3-5 have been rejected.

This response accompanies a Request for Continued Examination (RCE). The amendments to Claim 1 specify the nature of the antenna as made of a conducting material. Support for the amendments can be found in the originally filed specification. No statutory new matter has been added.

Claim Rejections under 35 U.S.C. § 103 (a)

Claim 1 stands rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Endo (US 6,429,518) in view of Redeker et al. (US 5,800,621), Okumura et al. (US 6,093,457), Endo et al. (U.S. Patent 6,197,704) and Suzuki (US 5,803,975. Schuegraf et al. ("Ultra-thin Silicon Dioxide Leakage Current and Scaling Limit", 1992 Symposium on VLSI Technology Digest of Technical Papers, pp. 18-19) is cited as evidence of material properties. Applicants respectfully traverse.

Antenna Placement

Applicants note that in the earlier Office Action, mailed November 1, 2010, the Examiner references a statement "radiating a microwave in a flat antenna member disposed opposite to the support device (column 4, lines 9-13)". Applicants wish to bring to the Offices attention that Endo only describes a "quartz transmission window 23". Endo does not expressly mention antenna. Clarification is requested. JP 2002-299330A is of record.

Specific fluorine-containing carbon film- specified upper level values for the dielectric constant, 2.3, and leakage current, 5×10^{-8} A/cm^2

A feature of the present invention resides in that, when a CF film is deposited by using the apparatus recited in claim 1, the CF film has a relative dielectric constant of 2.3 or below and a leakage current of $5x10^{-8}A/cm^2$ or below. Applicants urge that a CF film having such a leakage could not be achieved prior to the Applicants' invention. For example, as shown by the "o" mark in Fig. 6 , a CF film deposited by ECR plasma (the same apparatus as that of Endo (6,429,518)) has a leakage current of about $3x10^{-7}$, which is more than twice that of the present invention.

The Advisory Action and the Final Office Action suggest that a film having the claimed leakage current values is not inventive. The line of reasoning presented in the actions appears to suggest that one can analogize from a leak current associated with a multilayer structure system to the leak current of an individual film. The basis for this is not apparent. Further, the basis for assuming that a leak current flowing through a single CF film in a multilayer wiring structure is proportional to parasitic capacity is also unclear.

Further, the distinct preparatory methods taught in Endo and here suggest an expectation of differences in properties. The present method of synthesis addresses issue presenting the prior art methods. See 'Background" section. The claims are directed to the preparation of a specific fluorine-containing carbon film having specified upper level values for the dielectric constant, 2.3, and leakage current, 5×10^{-8} A/cm^2. This is attributed to a three-dimensional chain structure of CF_2 which results from the use of C_5F_8 as an educt and specific processing conditions, mean square velocity of 3 eV or below and electron density in the plasma producing space of 5×10^{11} electrons per cubic centimeter or above. The uniqueness of these conditions is evident from the background section of the present specification, on page 2, starting at line 26, where a trade off is described. The general process conditions of the invention are set forth starting on page 3 of the present specification at line 10. The benefits are clearly shown in Figures 5, 6, 7 and 8.

Endo does not describe the structure of the claimed fluorine-containing carbon film nor does Endo specify the claimed characteristics- a relative dielectric constant of 2.3 or below and a leakage current of $5x10^{-8}$ A/cm^2 or below- or the processing conditions.[1]

There is a dielectric constant and an insulation property (corresponding to the leak current of this patent application) that specify electric properties of an interlayer insulation film. Although the dielectric constant is closely related to a parasitic capacity of a multilayer wiring structure, the insulation property has nothing to do with the dielectric constant and is peculiar to the film. A leakage current of a multi layer wiring structure is determined by a dielectric constant (parasitic capacity) and an insulation property of an interlayer film. Even if the parasitic capacity is small, when the insulation property is degraded, the leakage current becomes large. Also consider, US 2009/0267168 A1 which describes a low-K film having a small parasitic capacity but has a large leakage current (e.g., paragraph 0013).

It is submitted that a proper prima facie case has not been established.[2] Withdrawal of the rejection is respectfully requested.

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[1] Endo (6,197,704) describes that a parasitic capacity for a multilayer wiring structure formed in a CF film is reduced by 50%. It does not solve the problem described in the paragraph bridging pages two and three of the present specification- incompatible parameters. Consider the second and third complete paragraphs on page three of the specification- the suppression of excessive source gas decomposition by employing electron temperatures of 3 eV or below.

[2] The Examiner seems to consider that it would be a just a designing matter to select the processing condition of an electron temperature of 2 eV or below, an electron density of $5x10^{11}$ electrons per cubic centimeter or above, and pressure of a processing atmosphere is 19.95 Pa or below. However, an electron temperature, an electron density and pressure of a processing atmosphere are very competitive and contradicting factors in "a plasma-assisted deposition method for forming an insulating film on a substrate placed on a support device in an airtight processing vessel by activating C_5F_8 gas by a plasma form gas". This is, for example, disclosed in page 2, line 4 to page 3, line 8. Then, it should be said the selection of the values of the processing condition of an electron temperature, an electron density and pressure of a processing atmosphere is not just a designing matter in this "a plasma-assisted deposition method for forming an insulating film on a substrate placed on a support device in an airtight processing vessel by activating C_5F_8 gas by a plasma forming gas". In the present invention, the concrete values of an electron temperature, an electron density and pressure of a processing atmosphere to be selected are discovered by Applicants' effort and ingenuity. For example, see page 11, line 36 to page 12, line 11 and page 12, line 21 to page 13, line 1.

CONCLUSION

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Therefore, it is respectfully requested that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

It is not believed that extensions of time are required. However, in the event that additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefore are hereby authorized to be charged to **Deposit Account No. 02-4300, Attorney Docket No. 033082M280.**

Respectfully submitted,

SMITH, GAMBRELL & RUSSELL, LLP

By: /Thomas G. Wiseman/

Thomas G. Wiseman, Reg. No. 35,046
1130 Connecticut Ave., NW, #1130
Washington, D.C. 20036
Telephone: (202) 263-4300
Facsimile: (202) 263-4329

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